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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Steven Maddocks et al.	§	Art Unit:	2182
		§		
Serial No.:	10/757,757	§		
		§	Examiner:	Tammara R. Peyton
Filed:	January 14, 2004	§		
		§		
For:	Interface Manager and Methods of Operation in a Storage Network	§	Atty. Dkt. No.:	200315416-1 (HPC.0402US)
		§		
		§		

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R § 41.37

Sir:

The final rejection of claims 12-18, 21, 22, and 24-34 is hereby appealed.

I. REAL PARTY IN INTEREST

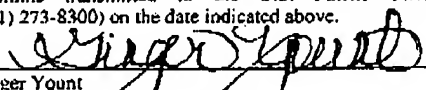
The real party in interest is Hewlett-Packard Development Company, L.P.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF THE CLAIMS

Claims 12-18, 21, 22, and 24-34 have been finally rejected and are the subject of this appeal. Claims 1-11, 19, 20, and 23 have been cancelled.

Date of Deposit:	August 11, 2008
I hereby certify under 37 C.F.R. 1.8(a) that this correspondence is being facsimile transmitted to the U.S. Patent Office (Fax No. (571) 273-8300) on the date indicated above.	
	
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Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

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IV. STATUS OF AMENDMENTS

An Amendment after final rejection was submitted on April 11, 2008. This Amendment after final rejection was not entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Independent claim 12 recites a method comprising:

receiving (Fig. 3:300), by an interface manager (Fig. 1:180), device information from a plurality of interface controllers (Fig. 1:170a-170c) operatively associated with storage system devices (Fig. 1:150a-150d), the device information relating to the storage system devices (Spec. pp. 12-13, ¶ [0040]);

generating (Fig. 3:310), by the interface manager, a logical map identifying at least some of the storage system devices based on the device information (Spec., p. 13, ¶ [0041]); and

assigning (Fig. 3:320), by the interface manager, the logical map to at least one host separate from the interface manager to enable access by the at least one host of the storage system devices (Spec., p. 13, ¶ [0042]).

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

Independent claim 21 recites a storage network comprising:

an automated storage system (Fig. 1:101) including data access drives (Fig. 1:150a-150d) and transfer robotics (Fig. 1:160; Spec., p. 6, ¶¶ [0019]-[0020]);

a plurality of interface controllers (Fig. 1:170a-170c) operatively associated with the data access drives and transfer robotics (Spec., p. 7, ¶ [0023]);

an interface manager (Fig. 2:200) separate from the data access drives, the transfer robotics, and the interface controllers, the interface manager communicatively coupled to each of the plurality of interface controllers, the interface manager to generate a logical map of the automated storage system based on aggregating configuration information for the data access drives and transfer robotics (Spec., pp. 7-8, ¶ [0025]); and

a pipeline (Fig. 2:270) provided as computer readable program code in computer-readable storage at the interface manager, the pipeline including:

a command router (Fig. 2:281) to format transactions for the interface controllers (Spec., p. 10, ¶ [0034]);

a management application program interface (API) (Fig. 2:282) to generate management commands for the plurality of interface controllers (Spec., p. 11, ¶ [0036]); and

a device manager (Fig. 2:283) to communicate with the plurality of interface controllers (Spec., pp. 11-12, ¶ [0037]).

Independent claim 25 recites an interface manager (Fig. 2:200) for use in a storage system (Fig. 1:101), comprising:

at least a first port (Fig. 2:230a-230d) to communicate with controllers (Fig. 2:210a-210b) operatively associated with storage system devices of the storage system (Spec., pp. 8-9, ¶ [0028]);

at least one network port (Fig. 2:240) to communicate with a host separate from the interface manager and external to the storage system (Spec., pp. 8-9, ¶ [0028]); and

at least one control element (Fig. 2:250) to:

receive device information relating to the storage system devices from the controllers (Spec., pp. 12-13, ¶ [0040]),

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

generate at least one logical map based on the received device information (Spec., p. 13, ¶ [0041]), and

assign the at least one logical map to the host to allow the host to access one or more of the storage system devices (Spec., p. 13, ¶ [0042]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- A. Claims 12-17, 25, 26, 28, 32, And 33 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over U.S. 6,212,606 (Dimitroff) In View Of U.S. Patent No. 6,779,078 (Murotani).**
- B. Claims 18, 21, 22, 24, 27, And 29-31 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Dimitroff, Murotani, And U.S. Patent Application Publication No. 2004/0032430 (Yung).**

VII. ARGUMENT

The claims do not stand or fall together. Instead, Appellant presents separate arguments for various independent and dependent claims. Each of these arguments is separately argued below and presented with separate headings and sub-headings as required by 37 C.F.R. § 41.37(c)(1)(vii).

- A. Claims 12-17, 25, 26, 28, 32, And 33 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over U.S. 6,212,606 (Dimitroff) In View Of U.S. Patent No. 6,779,078 (Murotani).**

1. Claim 34.

No prior art rejection has been asserted against claim 34, which depends from claim 12.

Therefore, an indication of allowability of claim 34 is respectfully requested.

2. Claims 25, 28, 33.

It is respectfully submitted that the obviousness rejection of claim 25 over Dimitroff and Murotani is defective. To make a determination under 35 U.S.C. § 103, several basic factual inquiries must be performed, including determining the scope and content of the prior art, and

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

ascertaining the differences between the prior art and the claims at issue. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459 (1965). Moreover, as the U.S. Supreme Court held, it is important to identify a reason that would have prompted a person of ordinary skill in the art to combine reference teachings in the manner that the claimed invention does. *KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007).

The obviousness rejection is defective for at least two reasons: (1) the Examiner has mis-applied Dimitroff onto the elements of claim 25; and (2) Murotani does not disclose or hint at the subject matter asserted by the Examiner to be present in Murotani.

As disclosing the at least one control element clause of claim 25, the Examiner stated that the control element is part of the host 106 of Dimitroff. 1/11/2008 Office Action at 2. This mapping of the claimed control element to Dimitroff's host is clearly in error, as the control element of claim 25 is part of the interface manager of claim 25. Claim 25 specifically recites that the host is "**separate** from the interface manager," **and** the at least one control element is part the interface manager. Moreover, note that the interface manager of claim 25 is for use in a storage system, and that the interface manager has at least a first port to communicate with controllers operatively associated with storage system devices of the storage system, and at least one network port to communicate with a host that is external to the storage system. Since the at least one control element of claim 25 is part of the interface manager that is **separate** from a host external to a storage system, the statement by the Examiner that the at least one control element of claim 25 can be part of the host 106 of Dimitroff constitutes clear error. In view of this mis-application of Dimitroff to a claim element, the obviousness rejection is defective.

Moreover, the Examiner conceded that Dimitroff does not disclose "use of an interface manager that receives device information from a plurality of controllers and generates a logical

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

map of the storage system.” *Id.* at 3. Instead, the Examiner cited Murotani as disclosing this feature of claim 25. Specifically, the Examiner pointed to external manager 5 depicted in Fig. 1 of Murotani. Note that claim 25 recites that the interface manager is for use in a storage system. The external manager 5 is not part of Murotani’s storage system that includes disk array controllers 2-4 and various logical volumes 8-16. Even more fundamentally, the external manager 5 of Murotani does not receive device information relating to the storage system devices from the controllers, and generates at least one logical map based on the received device information, where the at least one logical map is assigned to a host to allow the host to access one or more of the storage system devices. The external manager 5 of Murotani collects access data to determine how data migration between different logical volumes is to proceed. Murotani, 5:22-45. However, deciding on migration of data between different logical volumes, as taught by Murotani, is different from receiving device information relating to the storage system devices from the controllers, generating at least one logical map based on the received device information, and assigning the at least one logical map to the host to access one or more of the storage system devices, as claimed.

In view of the foregoing, it is clear that even if Dimitroff and Murotani could be hypothetically combined, the hypothetical combination would not have led to the claimed subject matter.

Moreover, the Examiner made the following erroneous conclusory statement: “It would have been obvious to one of ordinary skill that the external manager perform the action as a logical map by enabling an disabling user access of system devices by retaining corresponding information about applications 17 to 19 on host unit 1 and on disk array controllers 2 to 4 which control the logical volumes.” *Id.* at 3. This conclusory statement finds no support in the

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

teachings of Murotani. As noted above, Murotani indicates that access information is to be monitored to determine data migration. The statement in the Examiner that it would have been obvious for the external manager to generate the logical map of claim 25 is based purely on speculation, without any rationale or evidence that would support this statement.

Therefore, it is clear that no reason existed that would have prompted a person of ordinary skill in the art to combine the teachings of Dimitroff and Murotani. Thus, the obviousness rejection of claim 25 and its dependent claims is clearly erroneous.

Reversal of the final rejection of the above claims is respectfully requested.

3. Claim 26.

Claim 26 depends from claim 25, and is therefore allowable for at least the same reasons as claim 25. Moreover, claim 26 further recites that the received device information (received by the at least one control element from controllers operatively associated with storage system devices of the storage system) includes at least one of numbers and types of storage system devices connected to the controllers, and capacities of storage system devices in the storage system. With respect to claim 26, the Examiner referred generally to Dimitroff (1/11/2008 Office Action at 4), without citing any specific passages of Dimitroff. A review of Dimitroff indicates that there is nothing in Dimitroff that provides any teaching or hint of the subject matter of claim 26. Namely, there is no teaching in Dimitroff of a control element to receive device information relating to storage system devices from controllers operatively associated with the storage system devices, where the device information includes at least one of numbers and types of storage system devices connected to the controller, and capacities of storage system devices in the storage system. Column 3 of Dimitroff refers to parametrics that include a security parametric, an access parametric, an availability parametric, an ownership parametric, and a

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

management parametric. Column 3 of Dimitroff further goes on to describe each of these parametrics – however, nowhere in Dimitroff is there any indication that such parametrics include numbers and types of storage system devices connected to the controllers, or capacities of storage system devices in the storage system.

The obviousness rejection of claim 26 is further defective in view of the foregoing reason.

Moreover, Murotani teaches the collection of access data, which is not “at least one of numbers and types of storage system devices connected to the controllers, and capacities of storage system devices in the storage system.”

Reversal of the final rejection of the above claim is respectfully requested.

4. Claim 32.

Claim 32 depends from claim 25, and is therefore allowable for at least the same reasons as claim 25. Moreover, claim 32 recites that the interface manager has a user interface to allow access of the at least one logical map to enable administrator modification of the at least one logical map. The rejection of claim 32 was grouped with the rejection of independent claim 25, and the Examiner did not provide how Dimitroff and/or Murotani discloses or hints at a user interface to allow access of at least one logical map to enable administrator modification of at the least one logical map. A review of Dimitroff and Murotani indicates that these references do not provide any hint of such a user interface. Therefore, the obviousness rejection of claim 32 is further defective for the foregoing reason.

Reversal of the final rejection of the above claim is respectfully requested.

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

5. Claims 12, 14-17.

The obviousness rejection of independent claim 12 is also defective. Claim 12 recites a method comprising:

- receiving, by an interface manager, device information from a plurality of interface controllers operatively associated with storage system devices, the device information relating to the storage system devices;
- generating, by the interface manager, a logical map identifying at least some of the storage system devices based on the device information; and
- assigning, by the interface manager, the logical map to at least one host separate from the interface manager to enable access by the at least one host of the storage system devices.

Claim 12 also recites that the interface manager is separate from a host – therefore, the mapping of the interface manager of claim 12 to the host 106 in Fig. 1 of Dimitroff constitutes legal error. Moreover, the obviousness rejection of claim 12 over Dimitroff and Murotani is further defective for reasons similar to those stated above with respect to claim 12.

Therefore, the obviousness rejection of claim 12 and its dependent claims is defective.

Reversal of the final rejection of the above claims is respectfully requested.

6. Claim 13.

Claim 13 depends from claim 12, and is therefore allowable for at least the same reasons as claim 12. Moreover, claim 13 recites aggregating configuration information from each of the storage system devices for the logical map.

The rejection of claim 13 was grouped with the rejection of claim 12, and the Examiner did not explain how Dimitroff and/or Murotani provides any teaching or hint of the subject matter of claim 13. There is nothing in these references to disclose or hint at aggregating

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

configuration information from each of the storage system devices for the logical map that is generated by the interface manager.

Therefore, the obviousness rejection of claim 13 is further defective for the foregoing reason.

Moreover, as noted by the Examiner, the external manager 5 of Murotani gathers “accessing state, which is the number of read/write commands for each application of the host unit 1 during a predetermined period” 1/11/2008 Office Action at 3. However, gathering access data, as taught by Murotani, is completely different from aggregating configuration information from each of the storage system devices. Therefore, claim 13 is further allowable since the hypothetical combination of Dimitroff and Murotani fails to disclose or hint at aggregating configuration information from each of the storage system devices for the logical map.

Reversal of the final rejection of the above claim is respectfully requested.

B. Claims 18, 21, 22, 24, 27, And 29-31 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Dimitroff, Murotani, And U.S. Patent Application Publication No. 2004/0032430 (Yung).

1. Claims 18, 27, 29, 31.

Claims 18, 27, 29, and 31 depend from claim 12 or claim 25. In view of the defective obviousness rejection of base claims 12 and 25 over Dimitroff and Murotani, it is respectfully submitted that the obviousness rejection of dependent claims over Dimitroff, Murotani, and Yung is also defective.

Reversal of the final rejection of the above claims is respectfully requested.

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

2. Claims 21, 22, 24.

Independent claim 21 was erroneously rejected as being obvious over Dimitroff, Murotani, and Yung.

In view of the defective combination of Dimitroff and Murotani, the obviousness rejection based on Dimitroff, Murotani, and Yung is also defective. Moreover, it is submitted that no reason existed that would have prompted a person of ordinary skill in the art to combine the teachings of Dimitroff, Murotani, and Yung. *See, KSR*, 127 S.Ct. at 1741. While Dimitroff is related to defining standardized share levels for different storage units, and Murotani is directed to monitoring access data to determine data migration, Yung is related to providing a user interface “for relatively large biological laboratories that have many instruments of different types.” Yung, Abstract. Since the teachings of Dimitroff, Murotani, and Yung are directed to very different applications, it is respectfully submitted that a person of ordinary skill in the art would not have been prompted to combine the teachings of Dimitroff, Murotani, and Yung to achieve the claimed invention. The obviousness rejection is therefore further defective for this additional reason.

Moreover, as discussed above, collecting access data as taught by Murotani is not the same as “aggregating configuration information” as recited in claim 21. More specifically, claim 21 recites that the interface manager is to generate a logical map of the automated storage system based on aggregating **configuration** information for the data access drives and transfer robotics. Therefore, even if Dimitroff, Murotani, and Yung could be hypothetically combined, the hypothetical combination would not have led to the claimed subject matter.

In view of the foregoing, the obviousness rejection of claim 21 and its dependent claims is clearly defective.

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

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Reversal of the final rejection of the above claims is respectfully requested.


CONCLUSION

In view of the foregoing, reversal of all final rejections and allowance of all pending claims is respectfully requested.

Respectfully submitted,

Date: _____

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Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

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VIII. APPENDIX OF APPEALED CLAIMS

The claims on appeal are:

- 1 12. A method comprising:
2 receiving, by an interface manager, device information from a plurality of interface
3 controllers operatively associated with storage system devices, the device information relating to
4 the storage system devices;
5 generating, by the interface manager, a logical map identifying at least some of the
6 storage system devices based on the device information; and
7 assigning, by the interface manager, the logical map to at least one host separate from the
8 interface manager to enable access by the at least one host of the storage system devices.
- 1 13. The method of claim 12 further comprising aggregating configuration information from
2 each of the storage system devices for the logical map.
- 1 14. The method of claim 12 further comprising propagating management commands to each
2 of the plurality of interface controllers.
- 1 15. The method of claim 12 further comprising routing transactions from the at least one host
2 to at least one of the interface controllers.
- 1 16. The method of claim 12 further comprising formatting transactions from the at least one
2 host for a designated interface controller.
- 1 17. The method of claim 12 further comprising scheduling access by the at least one host to
2 the storage system devices.
- 1 18. The method of claim 12 further comprising identifying the storage system devices in the
2 logical map as logical units (LUNs).

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

21. A storage network comprising:

an automated storage system including data access drives and transfer robotics;

a plurality of interface controllers operatively associated with the data access drives and transfer robotics;

an interface manager separate from the data access drives, the transfer robotics, and the interface controllers, the interface manager communicatively coupled to each of the plurality of interface controllers, the interface manager to generate a logical map of the automated storage system based on aggregating configuration information for the data access drives and transfer robotics; and

a pipeline provided as computer readable program code in computer-readable storage at the interface manager, the pipeline including:

a command router to format transactions for the interface controllers;

a management application program interface (API) to generate management commands for the plurality of interface controllers; and

a device manager to communicate with the plurality of interface controllers.

22. The storage network of claim 21 wherein the management API generates at least the following management commands: reboot, interrogate, and status.

24. The storage network of claim 21 wherein the management API schedules access to the data access drives and transfer robotics.

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

- 1 25. An interface manager for use in a storage system, comprising:
2 at least a first port to communicate with controllers operatively associated with storage
3 system devices of the storage system;
4 at least one network port to communicate with a host separate from the interface manager
5 and external to the storage system; and
6 at least one control element to:
7 receive device information relating to the storage system devices from the
8 controllers,
9 generate at least one logical map based on the received device information, and
10 assign the at least one logical map to the host to allow the host to access one or
11 more of the storage system devices.
- 1 26. The interface manager of claim 25, wherein the received device information includes at
2 least one of numbers and types of storage system devices connected to the controllers, and
3 capacities of storage system devices in the storage system.
- 1 27. The interface manager of claim 25, wherein the at least one control element includes a
2 pipeline to route management commands to the controllers.
- 1 28. The interface manager of claim 25, wherein the at least one control element includes a
2 command router to format transactions for the controllers.
- 1 29. The interface manager of claim 25, wherein the at least one control element includes a
2 management application program interface (API) to generate management commands for the
3 controllers.
- 1 30. The interface manager of claim 29, wherein the management API schedules access to
2 data access drives and transfer robotics.

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

1 31. The interface manager of claim 25, wherein the storage system devices include data
2 access drives and transfer robotics, and wherein the data access drives and transfer robotics are
3 identified by a fibre channel port and logical units (LUNs) in the logical map.

1 32. The interface manager of claim 25, further comprising a user interface to allow access of
2 the at least one logical map to enable administrator modification of the at least one logical map.

1 33. The interface manager of claim 25, wherein the at least one control element is configured
2 to further:
3 monitor for a change in a state of the storage system devices; and
4 in response to the change, modify the at least one logical map.

1 34. The method of claim 12, further comprising:
2 monitoring for a change in a state of the storage system devices; and
3 in response to the change, modifying the logical map.

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P. 19/20

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

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IX. EVIDENCE APPENDIX

None.

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P. 20/20

Appln. Serial No. 10/757,757
Appeal Brief Under 37 C.F.R. § 41.37

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X. RELATED PROCEEDINGS APPENDIX

None.